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Review

Differentiation of self: A scoping review of Bowen Family Systems Theory's core construct

M. Calatrava [a,b,c], Mariana V. Martins [d], M. Schweer-Collins [e], C. Duch-Ceballos [f], M. Rodríguez-González [a,b,c,*]

[a] Institute for Culture and Society, University of Navarra, Pamplona, Spain
[b] School of Education and Psychology, University of Navarra, Pamplona, Spain
[c] IdiSNA, Navarra Institute for Health Research, Pamplona, Spain
[d] Faculty of Psychology and Education Sciences, University of Porto, Portugal
[e] Prevention Science Institute, University of Oregon, Oregon, United States
[f] Department of Psychology Development, University of Santiago de Compostela, Santiago de Compostela, Spain

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ABSTRACT

Bowen Family Systems Theory's central construct, differentiation of self (DoS), is one of the most recognized constructs to systemic researchers and psychology professionals. The present study reviewed the available evidence on DoS from the inception of the construct until July 31, 2020. A scoping review was conducted and a total of 295 primary studies were eligible for inclusion. Literature was categorized according to the hypotheses postulated by Bowen regarding: the associations between DoS and psychological and health outcomes and how DoS stability and similarity in partner levels operate within family systems. Descriptive data regarding studies on the measurement of DoS and in the area of psychotherapy were also compiled. Results revealed that there is ample support for DoS as a predictor of psychological health and marital quality, and that there are positive associations between DoS and better physical health and intergenerational relationships. Results of this review show that there continue to be underexplored hypotheses and a paucity of longitudinal or causal research designs to test the stability of DoS, the intergenerational transmission of DoS, and the efficacy of clinical interventions in modifying DoS to promote optimal well-being. Recommendations and next steps for researchers and practitioners are outlined.

1. Introduction

Psychotherapy approaches based on systems theory represent a small percentage of the psychotherapy interventions in the United Statesnited and Canada, yet they hold clinical relevance toward understanding the family system and dysfunction within that system. In contrast to their limited adoption in the United States, systemic theory and training and research on clinical interventions rooted in systemic approaches show they have been adopted across several other countries (Messent, 2017). Systemic approaches are focused on the relationship rather than only the treatment of the individual. DDDDDivorce, couple conflict, and intergenerational conflicts are a few of many examples of relational problems with a notable negative effect on the mental and physical health of the individual, problems for which there is ever-increasing evidence that systemic therapy is an effective treatment (Carr, 2020).

Psychotherapists and clinical psychologists are trained using programs partially or completely based on systems theory approaches (e.g., Minuchin, Bowen, Selvini, Haley, and Watzlawick) in several countries across the globe including in the United States (e.g., American Association for Marriage and Family Therapy), Canada (e.g., The Canadian Association for Marriage and Family Therapy), the United Kingdom (e.g., Association for Family Therapy and Systemic Practice), Spain (e.g., Federación Española de Asociaciones de Terapia Familiar), and Portugal (e.g., Sociedade Portuguesa de Terapia Familiar). In the United States specifically, there is a growing demand for professionals with specialized credentials and training to effectively provide relational treatment, with recent estimates predicting the number of jobs in this field will increase by 22% in the next 10 years (Dubina, Kim, Rolen, & Rieley, 2020). Consequently, there is a critical need for studies that are scoping or systematic reviews which help to clarify the state of the research in

* Corresponding author at: Campus Universitario, Universidad de Navarra, 31080 Pamplona, Spain.
E-mail address: mrgonzalez@unav.es (M. Rodríguez-González).

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this field.

1.1. Differentiation of self: construct and hypotheses

Bowen Family Systems Theory (BFST) represents one of the main grounded theoretical frameworks used in marriage and family therapy approaches (Nichols & Schwartz, 2004). The development of BFST started in the 1950s (Bowen, 1978). During the period between 1950 and 1970, the field of clinical psychology underwent a paradigm shift from the intrapsychic to the relational-systemic lens. Bowen was one of the leaders of this process, together with other relevant clinicians and scholars (e.g., Minuchin, MRI group). In 1978, differentiation of self (DoS) took shape with the publication of Bowen's book *Family Therapy in The Clinical Practice* (Bowen, 1978), which represents a compilation of papers written by Bowen from 1957 to the 1970s. Since 1978 — but particularly in the last 20 years — empirical studies using BFST and its cornerstone concept, DoS, as a framework have grown.

Differentiation of self (DoS) involves the capacity to maintain emotional objectivity amidst high levels of anxiety in a system while concurrently relating to key people in the system (e.g., partner, children, siblings, friends; Bowen, 1978; Rodríguez-González & Kerr, 2011). Bowen hypothesized that DoS is a stable trait beginning in emerging adulthood, although it can be modified by significant stressful life events, prolonged stress situations, or psychotherapy (Bowen, 1978). Individuals with higher levels of DoS are able to better modulate emotional arousal experienced during challenging interpersonal situations, and consequently, they show greater emotional maturity and interpersonal competence (Miller, Anderson, & Keals, 2004; Rodríguez-González et al., 2019a; Skowron, 2000). Higher levels of DoS have also been linked with better physical health (Peleg, Yaniv, Katz, & Tzischinsky, 2018; Rodríguez-González et al., 2019c), better psychological health (Jankowski et al., 2013a; Rodríguez-González et al., 2019a), and greater parental competency (Skowron, Kozlowski, & Pincus, 2010).

Bowen Family Systems Theory and its core concept, DoS, are composed of several interlocking assumptions and concepts such as the "multigenerational transmission process" and the "nuclear family emotional process" (Bowen, 1978; Kerr & Bowen, 1988; Rodríguez-González & Kerr, 2011), which are used to guide a view of the human being and the way relationships work in the family and are key guidelines when conducting psychotherapeutic and clinical interventions. The level of DoS is a result of how anxiety is transmitted from generation to generation (multigenerational transmission process). In every generation, although other siblings could benefit, the child most involved in the family's fusion reduces its differentiation in a process called by Bowen as family projection process (Bowen, 1978; Nichols & Schwartz, 2004).

Moreover, fusion, emotional reactivity, and emotional cutoff are some of the ways the families deal with the emotional forces in the family system, which are linked with the levels of DoS of membersof of the family (to learn more about BFST see Nichols & Schwartz, 2004). Thus, although DoS has been defined as an individual (intrapsychic) trait-like (stable) construct by Bowen (1978), it is thought to be the result of the emotional functioning and emotional patterns in the family — both across generations and in the family of origin — and it has direct consequences for the family system patterns of functioning and interaction. Thus, some scholars have operationalized the measurement of DoS as a trait of the family as a system rather than as an individual trait.

The most structured operationalization of these two dimensions of DoS has been proposed by Skowron and Friedlander (1998). They suggest the intrapersonal dimension of DoS could be identified via emotional reactivity and the I-position, which is the ability to thoughtfully adhere to one's convictions even when pressured to do otherwise. Likewise, the interpersonal dimension of DoS is proposed to be linked with emotional cutoff— which is thought to be driven by fears of intimacy and the accompanying behavioral defenses against those fears — and fusion with others, defined as emotional overinvolvement with significant others and overidentification with one's family of origin. Bowen made several hypotheses about the importance of DoS to functioning, including a hypothesis that individuals with higher levels of DoS are more likely to endorse better psychological and physical health (e.g., Hooper & Doehler, 2011; Skowron, Wester, & Azen, 2004), lower levels of family and couple conflict (e.g., Rodríguez-González et al., 2019b), and greater satisfaction in their couple relationships (Rodríguez-González et al., 2019a; Skowron, 2000). Regarding couple relationships, Bowen also proposed what is labeled in the literature as the similarity hypothesis— individuals select partners who have similar levels of DoS (Bartle, 1993; Ferreira, Narciso, Novo, & Pereira, 2016; Kosek, 1998). This hypothesis corresponds to the concept of multigenerational transmission process, which we previously described. Other BFST hypotheses are that levels of DoS are similar across generations (e.g., Harvey, Curry, & Bray, 1991; Tuason & Friedlander, 2000; connected with the concept of multigenerational transmission process), that DoS is universal and valid across different cultures (e.g., Işik, Özbiler, Schweer-Collins, & Rodríguez-González, 2020; Lam & Chan-So, 2015; Lampis, Cataudella, Speziale, & Elat, 2020), and finally, that an individual's level of DoS is central in one's ability to manage stress (e.g., Bartle-Haring & Gregory, 2003; Rodríguez-González et al., 2019b).

Bowen Family Systems Theory views the family as an emotional unit and uses systems thinking to describe the complex interactions between members of the family (Bowen, 1978). There is some degree of interdependence in all interpersonal relationships. People with higher levels of differentiation maintain a measure of autonomy within their intimate relationships. The less developed a person's self, the more others influence that individual's functioning. Bowen theorized that the emotional experiences and the emotional dynamic of the family of origin are central in determining the individual's level of DoS. Bowen also ascertained that an individual's degree of DoS becomes stable at the beginning of emerging adulthood. According to Bowen, DoS is independent of age, sex, culture, level of education or economic development. Moreover, Bowen hypothesized that levels of DoS are stable, with some potential of being modified through, for example, psychotherapy processes or major stressful events (Frost, 2014). The goal of any psychotherapy guided by BFST is to increase DoS levels (Frost, 2014; Rodríguez-González & Kerr, 2011).

1.2. Empirical research on differentiation of self

To date, there have been only two narrative literature reviews conducted on the topic of DoS and BFST (Charles, 2001; Miller et al., 2004). Although valuable, these reviews were conducted 16 to 20 years ago, and the research on DoS since this period has grown rapidly. Moreover, due to the narrative review approach, both lacked a systematic search and inclusion criteria to describe research regarding DoS (Grant & Booth, 2009).

Charles (2001) reviewed and synthesized eight articles, in which some aspect of the BFST was tested. In general, findings from the narrative review confirm tenets of BFST, and the author highlights some limitations related to the sampling methods used (e.g., use of convenient sampling), the generalizability of the research (i.e., studies were conducted on almost exclusively North American, Caucasian, predominantly female samples), or methodological limitations (e.g., none of the studies provided effect size data). The second narrative review conducted by Miller and colleagues (Miller et al., 2004) included almost 50 articles. The focus was the general hypotheses of BFST, not specifically the concept of DoS. This work documented that the included studies provided empirical support for Bowen's hypothesis about the positive relationship between greater differentiation and lower psychological distress and chronic anxiety, and higher marital satisfaction. Bowen's assumption that individuals selected partners with similar levels of differentiation was not supported by the included studies. According to this narrative review, there was no or very little research conducted on other BFST hypotheses at the time the review was conducted. Miller's

review (Miller et al., 2004) pointed out some limitations of the research in the BFST field. First, it confirmed similar limitations to those suggested by Charles (2001), highlighting the lack of empirical research about the universality of BFST (e.g., using different types of samples,inci including various race and cultural backgrounds). Second, the author's documented that there were important BFST theoretical assumptions that had received little attention (e.g., associations between DoS and physical health, the clinical effectiveness of BFST, and the intergenerational transmission of differentiation). Third, the authors highlighted the methodological limitations of the studies reviewed, concluding that "virtually all of the research has been bivariate, only testing the relationship between two variables" (Miller et al., 2004; p. 463). In its conclusions, this narrative review suggested that the advancement of BFST postulates would depend on the use of multivariate approaches with larger and diverse samples. More recently, Skowron and collaborators (Skowron, Van Epps, & Cipriano-Essel, 2014; Skowron, Van Epps, Cipriano-Essel, & Woehrle, 2015) provided summaries on DoS research, which were published in English and Spanish. Although these references are central for a greater understanding of BFST and DoS, the goal of these publications was not to provide a systematic or comprehensive review of the state of the field.

Since its definition in 1978, DoS has been increasingly used as a central theoretical concept in empirical research and clinical practice in the field of family therapy. Nevertheless, there are no systematic reviews on BFST that include a review of Bowen's hypotheses about DoS. No review exists, to our knowledge, which synthesizes the research on DoS as a central variable for explaining other relational, psychological, or physical health variables. There are several possibilities for the absence of a comprehensive review on the topic of DoS. For example, there have been few studies conducted with more rigorous designs such as randomized controlled trials or longitudinal studies, making it difficult to conduct a review that has a more constrained focus. Additionally, the range of studies conducted on DoS are quite broad in their focus (e.g., DoS is a moderator, outcome, or predictor). These issues, together with the complexity of BFST itself, make it particularly difficult to predefine the main research questions to explore through a systematic review, with focused inclusion and exclusion criteria.

To have a more comprehensive and structured knowledge of the literature on the topic of DoS, we conducted a scoping review of empirical studies published on this specific BFST concept. Scoping reviews provide a useful alternative to traditional literature reviews when clarification ofof a concept or theory is required (Munn et al., 2018). This approach combines the strengths of literature reviews (e.g., identifying conceptual contributions to embody existing theory) with a systematic and comprehensive search process to produce a rigorous evidence synthesis (Grant & Booth, 2009). Scoping reviews also specify opportunities for next-step systematic reviews and meta-analyses (Grant & Booth, 2009). Given the aforementioned gaps in the literature regarding differentiation, a scoping review provided an optimal method for beginning to classify and describe the nature of the body of research that has examined the concept of DoS.

1.3. Aims of the study

The primary goal of this scoping review was to map and examine the quantity and the nature of the scientific literature concerning the concept of DoS from the BFST, systematically organizing the findings around the following two topics:

a) the general characteristics of the studies conducted in the field (e.g., country of origin, sample, study design)
b) the empirical support for central DoS hypotheses based on BFST.

To the best of our knowledge, this is the first scoping review in the field of this theory.

2. Method

2.1. Protocol registration

The protocol for this scoping review was pre-registered on Open Science Framework (OSF; Calatrava, Rodríguez-González, & Schweer-Collins, 2020). OSF is a website and tool that permits researchers to transparently share aspects of the research process. Deviations from the published protocol or added procedures were declared in our preregistration (Calatrava et al., 2020). PRISMA Extension for Scoping Reviews (PRISMA-ScR) guidelines were followed and fulfilled (Tricco et al., 2018). PRISMA-ScR is a reporting guide for authors designed to increase the transparency and completeness of reporting methods for scoping reviews. A detailed PRISMA-ScR is provided in Supplement [File A].

2.2. Eligibility criteria

Eligibility criteria were updated as the study progressed using an iterative process based on feedback provided by the authors. Studies were included in this scoping review if they met the following criteria: (1) were reported as an original article; (2) examined the concept of DoS from BFST; (3) DoS was measured with a standardized questionnaire; (4) empirical data were reported in the article; (5) the standardized measure of DoS comprised more than one subscale— since studies with only one subscale would not have captured DoS as a multidimensional construct, which it is theorized to be. When multiple studies were found to have reported on the same study population, all eligible studies were included.

2.3. Search strategy

The search was conducted to identify all relevant literature reporting on the concept of DoS, based on BFST. In line with the pre-registered protocol (Calatrava et al., 2020), we followed a three-phase searching process. A preliminary search strategy was developed and pilotedby three authors (MRG, MM and MC). In the first stage, a comprehensive search was conducted in four electronic databases: PubMed, PsycInfo, PsycArticles, and WoS (Web of Science) by one author (MC). The search period covered the years from the inception of BFST (Bowen, 1978) to July 31, 2021. Database search strategies were limited to English, Spanish, and Portuguese languages. The syntax of the strategy contained broad terms to facilitate an extensive search aimed at systematically mapping the literature. The initial PubMed strategy was adapted for each database. The key search terms were: [(differentiation of self OR self-differentiation) AND Bowen] at full-text level. Searching history and the search strategy are available upon request from the first author. A review of grey literature was made by scanning the Grey Matters Checklist (a tool designed to help researchers identifyunpublished studies, such as theses, dissertations, technical reports, and conference abstracts) and searching through the OpenGrey platform[1] to minimize the risk of publication bias since the results of unpublished studies may differ from those of published studies (Mueller et al., 2018). Finally, additional articles were identified by searching Google Scholar and Google and by reviewing the reference lists of those articles selected for inclusion in the review. The final articles eligible for inclusion were compiled, and duplicates removed using EndNote X9 (EndNote, Clarivate Analytics). Covidence software was used to manage the screening process outlined below.

2.4. Study selection

We adopted an a priori definition of the key term DoS to avoid

[1] https://www.cadth.ca/resources/finding-evidence/grey-matters; and https://www.opengrey.com

terminological misunderstanding. Only those studies on DoS based on Bowen's theoretical framework were considered eligible for this review. The definition of DoS that we used in this review follows. DoS is a multidimensional construct related to emotional self-regulation capacity, which comprises an intrapersonal ability to differentiate between thinking and feeling systems and an interpersonal ability to maintain autonomy while simultaneously connecting to significant others at an intimate level (Bowen, 1978; Kerr & Bowen, 1988; Rodríguez-González & Kerr, 2011). It is a concept grounded in a specific theoretical framework proposed by the psychiatrist Dr. Murray Bowen in 1978.

Two reviewers with different discipline backgrounds independently assessed records for eligibility of titles and abstracts and screened the full texts of potentially relevant articles (i.e., a Psychologist expert in this research field-MRG, and a PhD expert in research methodology-MC). Every disagreement was resolved by discussion between reviewers. There were no persistent disagreements. Therefore, it was not necessary to introduce a third reviewer (MM) to reach consensus on study inclusion. The screening process is detailed in the PRISMA flow chart (Fig. 1).

Calibration exercises to improve the reliability of agreement between reviewers were completed for the phases of screening titles and abstracts and the selection of full texts. Before starting the formal screening of full texts, training screening tests were performed and the inter-rather percentage agreement was calculated at higher than 90–94%, according to the established protocol (Calatrava et al., 2020).A document was developed to specify and clarify eligibility criteria. At the first stage, all references selected by two reviewers (MC and MRG) were included and screened at the full-text level. More than three hundred articles (k = 365) were retained for full-text screening. A summary of the articles excluded through the full-text screening phase (k = 92) and the reason for exclusion are detailed in Supplemental Table 1.

2.5. Data extraction

The included studies reported on multiple outcomes and often used more than one method and tested more than one hypothesis. Findings and data from included studies were organized by each of the seven hypotheses and the research topics of our work (see Table 1). Three quarters (75%) of the data were double coded by two reviewers (MC and CDC) using a standardized Excel spreadsheet designed for this study and adapted after the pilot trial charting exercise. A third author (MRG) performed a crosscheck of the remaining 25% of the extracted data.

The following data were coded from each record: study author names, year of study publication, study population (i.e. adolescents/college or emergent adults/couples/families/other), study setting (i.e.,

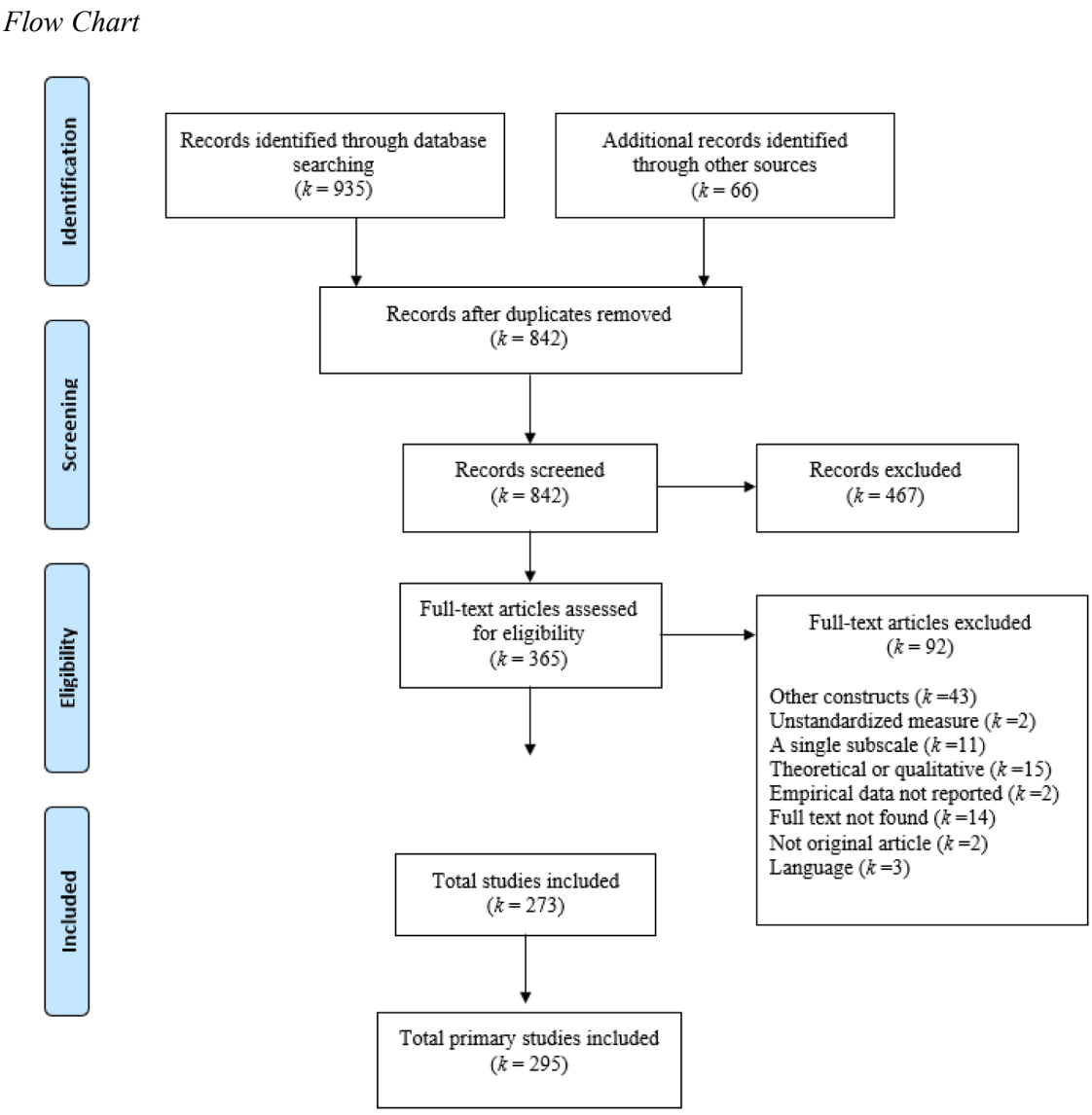


Fig. 1. Flow chart.

Table 1
The hypotheses and topics.[a]

	HYPOTHESES	DESCRIPTION [a]
H1	Higher levels of differentiation will be associated with better psychological health	Higher levels of differentiation, better psychological health (e.g. lower levels of depression, anxiety, etc. -as negative outcomes- or higher levels of happiness, well-being, etc. -as positive outcomes-)
H2	Higher levels of differentiation will be associated with better physical health	Higher levels of differentiation, better physical health (e.g. lower prevalence of fibromyalgia, obesity, etc.)
H3	Higher levels of differentiation will be associated with greater couple relationship quality and satisfaction	Higher levels of differentiation, better couple relationship (e.g. lower levels of marital conflict -as negative outcomes- or higher levels of dyadic adjustment, marital satisfaction, etc. -as positive outcomes-).
H4	Greater levels of differentiation will be associated with better intergenerational relationships	Higher levels of differentiation, better intergenerational relationships (e.g. family functioning, etc.)
H5	Couples will endorse similar levels of differentiation	People select partners with the same degree of differentiation of self as themselves.
H6	Levels of differentiation will show stability across time in adulthood	Levels of differentiation in adults are stable over time
H7	Levels_ of differentiation are similar across generations	Levels of differentiation are transmitted from one generation to another.
	TOPICS	**DESCRIPTION** [a]
T1	Measurement of Differentiation	Psychometric validations or adaptations of measure instruments of differentiation
T2	Psychotherapy and Differentiation	How differentiation impact on psychotherapeutic process (or conversely) or how is the relationship between differentiation and psychotherapeutic variables (e.g. therapeutic alliance, etc.)
T3	Other topics	This category group the remaining topics (e.g. stress, spirituality, etc.)

[a] Operational description of each hypothesis and topic category in this Scoping Review.

clinical, non-clinical, both), sample size, differentiation measure instrument (e.g., DSI, PAFS-Q, LDSS), study outcomes and instruments used to measure each outcome (e.g., marital adjustment and DAS; Dyadic Adjustment Scale), study design (i.e., one-group pre-post-test, quasi-experimental, cross-sectional, longitudinal), whether the study controlled for confounding factors in the analysis (yes or no). Extracted data were organized according to the seven specified Bowen hypotheses. In the case that more than one hypothesis was addressed in a single study, all available data were extracted. An assessment of the risk of bias was not conducted, in accordance to published guidelines on the conduct of scoping reviews, and this is addressed as a study limitation (Peters et al., 2015).

Due to the heterogeneity of studies in terms of methodology and outcomes investigated, we adopted a qualitative-descriptive synthesis, as suggested by the PRISMA-SCR (Tricco et al., 2018). Thus, among those studies testing Bowen's seven identified hypotheses, study findings were encoded as C (*confirmed Bowen's hypothesis*), M (*mixed Bowen's hypothesis*), and NC (*Bowen's hypothesis not confirmed*), taking into account the a priori specified criteria for each hypothesis. When these criteria were unclear, the final decision on the level of evidence was determined through the consensus of two reviewers (MRG and MC), according to the following schema: (1) if the study provided support for more than half of differentiation subscales or the study samples, the level of evidence of Bowen's hypothesis was coded as C (*confirmed*); or, (2) if a study only provided support for less than half of differentiation subscales or the study samples, the level of evidence of the Bowen's hypothesis was coded as NC (*not confirmed*). Only in those cases in which this proportion was fully balanced, the level of evidence for Bowen's hypothesis was coded as *mixed*. Note that one publication could test a Bowen hypothesis through different statistical tests or approaches (e.g., through mediation and moderation study hypotheses), and may have concluded different findings (e.g., confirmation of mediation, rejection of moderation). In such cases, the same criteria of balance between the different study hypotheses were adopted.

In those Bowen hypotheses on factors that were associated with DoS (H1, H2, H3 and H4), differentiation was the independent variable in the statistical models and could be related directly or indirectly, through mediators or moderators, to one or more outcomes (dependent variables). In addition, in Bowen hypotheses where differentiation could have served a mediating or moderating role between the dependent variable and other independent variables (H5, H6 and H7), outcome data were not gathered.

The studies that contained a research question that did not fit in one of the seven Bowen's hypotheses that we identified were organized around three major topic categories: (1) the topic of measurement, (2) the topic of studies on psychotherapy, and (3) the category *others*, which consisted of topics less frequently explored. The extensive heterogeneity of these studies in their methods, hypotheses, variables, and measures, lead us to process them differently, without coding their study findings (i.e., *Confirmed*, *Not-confirmed*, *Mixed*). Instead, we provided a descriptive overview of each topic (see OSF link for this protocol deviation). For these reasons, these studies will have a distinct space in the results and discussion sections.

3. Results

3.1. Selection of studies

After examining a total of 1,001 titles and abstracts (842 after removal of duplicates), we retrieved 365 full-text papers for further consideration. Two hundred and seventy-three records met criteria for inclusion in the review. The record selection process is summarized by a PRISMA 2009 flow chart (see Fig. 1). The reasons for exclusion included: language, not an original article, full text not found or not available, theoretical or qualitative study design, empirical data not reported, other construct not based on BFST, DoS measured through an unstandardized measure, or a single standardized subscale to measure the DoS. All studies were published in peer-reviewed journals. Agreement between raters was 93% for title and abstract screening, and 96% in screening full texts for inclusion.

Of the eligible 273 papers, several of them reported the results of more than one study, with each study being carried out with different samples and objectives, yielding an additional 22 studies. For the purposes of this scoping review, these studies were therefore considered as independent of each other although published in the same report or article. Thus, the final sample of primary studies included in the descriptive analyses was 295.

3.2. General characteristics of the included studies

The majority of the 295 primary studies were conducted in the United States ($k = 153$, 53.9%) and Israel ($k = 50$, 17.6%). Publication dates ranged from 1978 to 2020, with a significant number of articles published post-2000 ($k = 252$, 88.7%).

Among the 295 primary studies, 178 primary studies examined one or more of Bowen's seven hypotheses. H1, which refers to the positive association between DoS and psychological health ($k = 101$), and H3, which refers to the positive association between DoS and couple relationship functioning ($k = 56$), were the most investigated Bowen hypotheses. Conversely, the hypotheses that received the least attention in the field were H7, the intergenerational transmission of levels of DoS ($k = 5$), and H6, the stability in levels of DoS in adulthood ($k = 1$). Overall, all these hypotheses were predominantly tested into nonclinical samples

($k = 189$) and adopted the DoS Inventory (DSI) or its revised version (DSI-R), as the measurement of levels of DoS ($k = 157$). Almost half of the hypotheses ($k = 105$) were evaluated across different cultures (e.g., racial or ethnic minorities in the U·S) and in countries other than the United States. College students/emerging adults and couple study populations accounted for approximately half of the total number of primary studies ($k = 113$). Data on these primary study descriptors are displayed in Table 2.

The three major topics we identified (i.e., measurement, psychotherapy, and other) were evaluated in 152 primary studies. Topic 1 (T1) represents more than one-third of these special topic studies ($k = 51$). This category contains psychometric validations or adaptation studies of instruments used to measure DoS. In this category, two studies widely cited in the literature (Anderson & Sabatelli, 1992; Licht & Chabot, 2006) were excluded because their authors did not report empirical data (see Supplementary Table 1). The second topic (T2; $k = 16$) categorizes those primary studies focused on testing the relationship between psychotherapy (or counseling) and clients' levels of DoS, or the effect of psychotherapeutic variables (e.g., psychotherapeutic alliance) on DoS. Lastly, the remaining topics identified were grouped into a single category named *others* ($k = 85$). This topic area contains a variety of topics. The main characteristics of these primary studies are also presented in Table 2. The majority of these topical studies were conducted with nonclinical samples ($k = 137$), used predominantly college student or emerging adult samples ($k = 60$), and used the DSI or the revised version (DSI-R) to measure levels of DoS ($k = 104$). More than one-third ($k = 65$) of these topical studies were conducted in cultures and settings outside of the United States. Supplementary Tables 2–11 provide detailed information for each included study concerning the characteristics described above.

3.3. Methodological characteristics of the included primary studies

Overall, a wide range of study designs was used in the 295 primary studies. Most of them used a cross-sectional design ($k = 250$) or a longitudinal design ($k = 33$). Only one study was carried out with a randomized-controlled design, but DoS was not the main outcome in this study. The remaining primary studies used a one group test-retest design ($k = 7$) or a quasi-experimental design ($k = 4$). There is a large number of primary studies with sample sizes smaller than 500 ($k = 251$), which represents a major limitation of this body of empirical study, potentially limiting the validity of their findings. Specifically, 44 primary studies had sample sizes between 39 and 100, and most primary studies ($k = 207$) had small sample sizes ranging between 100 and 500 individuals.

Of the total sample of primary studies ($k = 295$), 219 used statistical analyses that controlled potential confounding factors, while a minority of primary studies ($k = 76$) provided descriptive or factorial analyses. In 49 studies, control variables were not applicable due to the nature of the study (e.g. the study evaluated the psychometric properties of a questionnaire). All included primary studies used a convenience sampling method. Therefore, primary study results cannot be generalized to the larger population and strongly limit the comparison of findings between primary studies. A graphical distribution of included primary studies grouped by study characteristics is shown in Fig. 2.

Table 3 provides a summary of the included primary studies, categorized by methodological characteristics and by the level of evidence for each hypothesis.

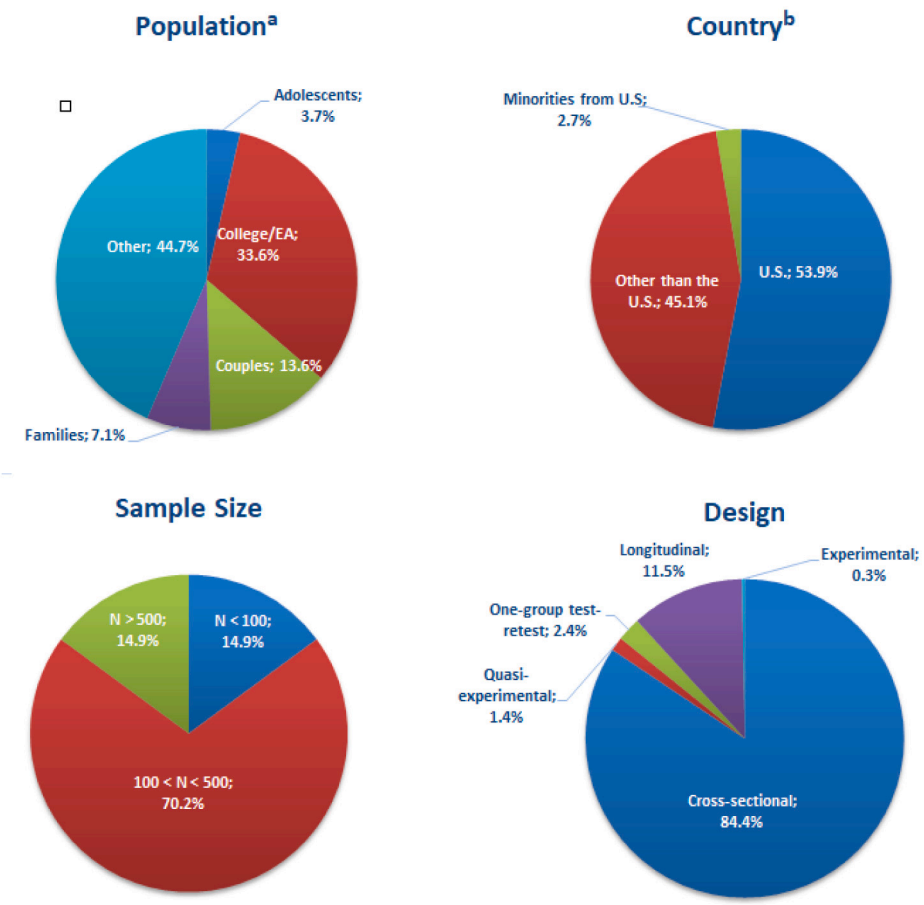
3.4. Empirical evidence of Bowen's construct differentiation of self

Hypothesis 1. *Higher Levels of Differentiation Will Be Associated With Better Psychological Health.*

Among the seven hypotheses, this first hypothesis has received the most empirical support in the field. Sixty-seven primary studies provided evidence in support of the hypothesized relationship, 29 primary studies found mixed findings, and five presented data that did not show support of the hypothesis (Table 3). The primary studies measured psychological health by using 78 different instruments, assessing different constructs such as depression (Beck Depression Inventory, 1996) or psychological distress (The Hopkins Symptom Checklist, 1983). Primary studies that demonstrated support of H1 used 14 different measures of DoS (ABERI, BERI, DSR-C, LDSS, PAFS-Q, PAFS-QVC, SDS, Chabot Scale, PSI, CDS, DSI, DSS, DSI-SF, and DSI-R),

Table 2
Characteristics of the primary studies.

Characteristics of primary studies		Setting			Population					DSI/DIS-R [a]	Cross-cultural [b]
	K	Clinical [c] *k* (%) [e]	Nonclinical *k* (%) [e]	Both *k* (%) [e]	Adolescents *k* (%) [e]	CE/ EA [d] *k* (%) [e]	Couples *k* (%) [e]	Families *k* (%) [e]	Other *k* (%) [e]	*k* (%) [e]	*k* (%) [e]
Hypotheses											
H1: Psychological health	101	8 (7.9)	87 (86.1)	6 (5.9)	4 (4.0)	48 (47.5)	6 (5.9)	6 (5.9)	39 (38.6)	75 (74.3)	49 (48.5)
H2: Physical health	17	3 (17.6)	13 (76.5)	1 (5.9)	1 (5.9)	9 (52.9)	0 (0.0)	1 (5.9)	7 (41.2)	11 (64.7)	9 (52.9)
H3: Couple relationship	56	4 (7.1)	50 (89.3)	2 (3.6)	1 (1.8)	5 (8.9)	23 (41.1)	0 (0.0)	28 (50.0)	43 (76.8)	27 (48.2)
H4: Intergenerational relationships	19	0 (0.0)	19 (100.0)	0 (0.0)	0 (0.0)	3 (15.8)	2 (10.5)	7 (36.8)	8 (42.1)	14 (73.7)	13 (68.4)
H5: Similarity	16	2 (12.5)	14 (87.5)	0 (0.0)	0 (0.0)	0 (0.0)	15 (93.8)	1 (6.3)	0 (0.0)	11 (68.8)	5 (31.3)
H6: Stability	1	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)
H7: Intergenerational transmission	5	0 (0.0)	5 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (80.0)	0 (0.0)	2 (40.0)	2 (40.0)
Total	215	17 (7.9)	189 (87.9)	9 (4.2)	6 (2.8)	65 (30.2)	48 (22.3)	19(8.8)	82 (38.1)	157 (73.0)	105 (48.8)
Topics											
T1: Measurement	51	3 (6.0)	48 (94.1)	0 (0.0)	1 (2.0)	13 (25.5)	1 (2.0)	3 (5.9)	34 (66.7)	27 (52.9)	20 (39.2)
T2: Psychotherapy	16	9 (56.3)	7 (43.8)	0 (0.0)	0 (0.0)	1 (6.3)	7 (43.8)	0 (0.0)	10 (62.5)	10 (62.5)	2 (12.5)
T3: Others	85	3 (3.5)	82 (96.5)	0 (0.0)	8 (9.4)	46 (54.1)	5 (5.9)	6 (7.1)	21 (24.7)	67 (78.8)	43 (50.6)
Total	152	15(9.9)	137 (90.1)	0 (0.0)	9 (5.9)	60 (39.5)	13 (8.6)	9 (5.9)	65 (42.8)	104 (68.4)	65 (42.8)



Total percentage slightly higher than 100% because some primary studies were conducted to different types of population samples.

Total percentage slightly higher than 100% because some primary studies were conducted to different cultural contexts.

Fig. 2. Characteristics of the primary studies (k = 295).
[a] Total percentage slightly higher than 100% because some primary studies were conducted to different types of population samples.
[b] Total percentage slightly higher than 100% because some primary studies were conducted to different cultural contexts.

whereas, for example, the five primary studies where no evidence in support of H1 was found used the DSI or the DSI-R. All but one of the longitudinal studies (k = 12) provided evidence that confirmed the positive association between DoS and psychological health outcomes (and the one exception had mixed findings; more details about these primary studies are shown in Table A.2., supplementary material).

Hypothesis 2. *Higher Levels of Differentiation Will Be Associated with Better Physical Health.*

Among the primary studies that examined hypothesis 2, eleven found evidence that lower levels of DoS were associated with greater physical health problems, providing support for this hypothesis. Additionally, four primary studies provided mixed findings, but two primary studies did not provide evidence in support of H2 (Table 3). Physical health was measured by 13 different instruments, assessing different constructs such as physical symptoms (Physical Symptoms Scale, 2000) or health distress (The Symptom Index, 1982). Primary studies with mixed or rejected findings for H2 show a greater proportion of samples containing college students or emerging adults relative to those studies where this hypothesis is confirmed. Furthermore, the heterogeneity of the instruments for measuring DoS among confirmatory primary studies is much higher (e.g., PAFS-Q, PAFS-QVC, SDS, DSI, and DSI-R) relative to the primary studies that obtained mixed or findings that did not show evidence in support of H2 (DSI and DSI-R). Lastly, all primary studies that contained mixed results were conducted in samples outside the United States (i.e., Israel, Italy, and Spain), whereas the primary studies that found clearer results (not confirmed or confirmed findings) were conducted with samples from the United States (see Table A.3., supplementary material).

Hypothesis 3. *Higher Levels of Differentiation Will Be Associated with Greater Couple Relationship Quality and Satisfaction.*

Out of the primary studies testing the third hypothesis, the majority demonstrated evidence that greater levels of DoS are associated with better couple relationships (k = 39). Additionally, 12 primary studies provided partial support to H3 through mixed findings, whereas only five primary studies did not have evidence in support of H3 (Table 3). Couple relationships were examined with 34 different instruments, assessing different constructs such as dyadic adjustment (e.g., Dyadic Adjustment Scale 1976), marital satisfaction (e.g., Couple Satisfaction Index, 2007) and sexual satisfaction (e.g., Global Measure of Sexual Satisfaction, 1998). Among the primary studies confirming H3, DoS was

Table 3
Characteristics of primary studies by level of evidence in each hypothesis.

Hypotheses ($K = 214$)	All studies	Studies with specific characteristics				
		Study design	Sample size			Statistical analyses
	k (%)	Longitudinal *k* (%)	<100 *k* (%)	100–500 *k* (%)	>500 *k* (%)	Adjusted [a] *k* (%)
H1: Psychological health						
Confirmed	67 (66.3)	12 (92.3)	5 (45.5)	54 (73.0)	8 (50.0)	58 (64.4)
Mixed	29 (28.7)	1 (7.7)	4 (36.4)	20 (27.0)	5 (31.3)	28 (31.1)
Not confirmed	5 (5.0)	0 (0.0)	2 (18.2)	0 (0.0)	3 (18.8)	4 (4.4)
Total	101 (100.0)	13 (100.0)	11 (100.0)	74 (100.0)	16 (100.0)	90 (100.0)
H2: Physical health						
Confirmed	11 (64.7)	2 (100.0)	1 (50.0)	8 (72.7)	2 (50.0)	11 (64.7)
Mixed	4 (23.5)	0 (0.0)	0 (0.0)	3 (27.3)	1 (25.0)	4 (23.5)
Not confirmed	2 (11.8)	0 (0.0)	1 (50.0)	0 (0.0)	1 (25.0)	2 (11.8)
Total	17 (100.0)	2 (100.0)	2 (100.0)	11 (100.0)	4 (100.0)	17 (100.0)
H3: Couple relationship						
Confirmed	39 (69.6)	5 (55.6)	4 (80.0)	30 (68.2)	5 (71.4)	36 (67.9)
Mixed	12 (21.4)	2 (22.2)	0 (0.0)	10 (22.7)	2 (28.6)	12 (22.6)
Not confirmed	5 (8.9)	1 (11.1)	1 (20.0)	4 (9.1)	0 (0.0)	5 (9.4)
Total	56 (100.0)	8 (100.0)	5 (100.0)	44 (100.0)	7 (100.0)	53 (100.0)
H4: Intergenerational relationship						
Confirmed	13 (68.4)	1 (50.0)	3 (100.0)	8 (61.5)	2 (66.7)	11 (64.7)
Mixed	5 (26.3)	1 (50.0)	0 (0.0)	4 (30.8)	1 (33.3)	5 (29.4)
Not confirmed	1 (5.3)	0 (0.0)	0 (0.0)	1 (7.7)	0 (0.0)	1 (5.9)
Total	19 (100.0)	2 (100.0)	3 (100.0)	13 (100.0)	3 (100.0)	17 (100.0)
H5: Similarity						
Confirmed	2 (12.5)	0 (0.0)	0 (0.0)	2 (20.0)	0 (0.0)	1 (11.1)
Mixed	5 (31.3)	2 (100.0)	1 (25.0)	2 (20.0)	2 (100.0)	3 (33.3)
Not confirmed	9 (56.3)	0 (0.0)	3 (75.0)	6 (60.0)	0 (0.0)	5 (55.6)
Total	16 (100.0)	2 (100.0)	4 (100.0)	10 (100.0)	2 (100.0)	9 (100.0)
H6: Stability						
Confirmed	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mixed	1 (100.0)	1 (100.0)	0 (0.0)	0 (0.0)	1 (100.0)	1 (100.0)
Not confirmed	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	1 (100.0)	1 (100.0)	0 (0.0)	0 (0.0)	1 (100.0)	1 (100.0)
H7: Intergenerational transmission						
Confirmed	2 (40.0)	1 (50.0)	0 (0.0)	1 (33.3)	0 (0.0)	1 (25.0)
Mixed	1 (20.0)	1 (50.0)	0 (0.0)	0 (0.0)	1 (100.0)	1 (25.0)
Not confirmed	2 (40.0)	0 (0.0)	0 (0.0)	2 (66.7)	0 (0.0)	2 (50.0)
Total	5 (100.0)	2 (100.0)	0 (0.0)	3 (100.0)	1 (100.0)	4 (100.0)

[a] Adjusted analyses are those that obtained an adjusted estimate, which takes into account the effect due to all the additional independent variables included in the analysis.

measured using eight different instruments (SDS, LDSS, BERI, NFSS, DIFS-C, PAFSQ, DSI, and DSI-R) whereas DoS was measured through the DSI, DSI-R or DSI-SF in 14 of the 16 primary studies that found mixed and not confirmed results. Among the primary studies where H3 was rejected, we found a high degree (3 of 5 primary studies) of samples with specific characteristics (i.e., couples seeking services at an on-campus clinic, romantic couples where one partner was involved in the military with a potential diagnosis of PTSD, or parents raising children with special needs). We did not find other patterns or differences between the primary studies where H3 was confirmed and the other two groups (mixed and not confirmed; see Table A.4., supplementary material).

Hypothesis 4. *Greater Levels of Differentiation Will Be Associated with Better Intergenerational Relationships.*

A total of 13 primary studies provided evidence in support of the hypothesis that greater levels of DoS would be associated with better intergenerational relationships (e.g., higher family functioning, better communication, and satisfaction, or less conflict) and five primary studies provided partial support (mixed findings). In contrast, only one study did not show evidence in support of H4 (Ford, Nalbone, Wetchler, & Sutton, 2008;Table 3). To evaluate the association between DoS and intergenerational relationships, 19 different instruments were used, assessing different constructs such as conflict management style (e.g., Conflict Resolution Survey, 1981), child abuse potential (e.g., Child Abuse Potential Inventory, 1990), and family resilience (Family Resilience Assessment Scale, 2005). Primary studies testing H4 ($k = 13$) used three different measures of DoS (LDSS, DSI and DSI-R;see Table A.5. in supplementary material).

Hypothesis 5. *Couples Will Endorse Similar Levels of Differentiation.*

Empirical support for the fifth hypothesis was limited. Most of the included primary studies ($k = 9$) did not show evidence in support of the H5, whereas two primary studies provided evidence in support of H5. Five primary studies found mixed results (Table 3).

No primary studies used representative sampling methods and 75% of the studies testing H5 ($k = 12$) had a sample size smaller than 500 (Table 2). Similarity of couples' DoS levels was commonly tested through different statistical analyses and methodologies: correlations ($k = 3$; Bartle, 1993; Rodríguez-González, Skowron, Cagigal de Gregorio, & Muñoz San Roque, 2016), *t*-tests ($k = 6$; Bartle-Haring & Gregory, 2003; Kosek, 1998; Lal & Bartle-Haring, 2011; Lim & Jennings, 1996; Peleg & Yitzhak, 2011), mean difference testing between two groups-generally, the "pseudo-couple" method- ($k = 6$; Bartle-Haring & Gregory, 2003; Day, St Clair, & Marshall, 1997; Ferreira et al., 2016; Kosek, 1998; Skowron, 2000; Spencer & Brown, 2007), and other advanced dyadic statistical analyses, such as latent profile analysis (LPA) or structural equation modelling (SEM; $k = 5$; Bartle-Haring, Ferriby, & Day, 2019; Handley, Bradshaw, Milstead, & Bean, 2019; Richards, 1989; Shannon & Bartle-Harring, 2017; Tuason & Friedlander, 2000; see Table A.6., supplementary material).

Hypothesis 6. *Levels of Differentiation Will Show Stability Across Time in*

Adulthood.

This sixth hypothesis has not yet received sufficient empirical attention and evidence of support. Only one research study has attempted to validate the hypothesis of stability in levels of DoS over time, and this study found mixed results. This study used a longitudinal design and advanced statistical analysis to test possible variations in DoS during the follow-up period. The levels of DoS of study participants were measured with the DSI (see Table A.7, supplementary material).

Hypothesis 7. *Levels of Differentiation Are Similar Across Generations.*

Similar to H6, Bowen's theory on the intergenerational transmission of DoS levels remain insufficiently investigated. Two studies confirmed H7 and two studies did not show evidence in support of this hypothesis. One additional study, using a longitudinal design, found mixed results (Harvey et al., 1991). Both studies that confirmed H7, are the most recent primary studies testing H7 and were conducted in 2005, one in Israel and the other in the United States. All other primary studies that test H7 were conducted prior to 2000 (see Table A.8, supplementary material).

3.5. Post-hoc data synthesis: other dos studies classified into three main topic areas

A total of 152 primary studies explored hypotheses or theoretical ideas not clearly outlined by BFST or specifically testing the seven identified DoS hypotheses. They were therefore classified, through a post-hoc protocol deviation, into the following three main topics: measurement, psychotherapy, and other. This section was intended to provide researchers and clinicians with information regarding the general topics these DoS studies address, thereby providing a more complete scoping review of the DoS literature. Similar to the methods by which we described other empirical studies in this scoping review, we outline the general characteristics of these studies below.

3.5.1. Measurement

A total of 51 included primary studies addressed the topic of measuring the construct of DoS and the majority used cross-sectional designs ($k = 44$; 86%); were conducted in the United States ($k = 31$; 60.8%); involved samples from the general population ($k = 34$; 66.7%); and included samples of greater than 100 individuals ($k = 43$; 84.3%). The majority of included studies on this topic were validation studies on measures to assess the DoS construct ($k = 45$) and, specifically, with the Differentiation of Self Inventory (DSI; $k = 28$), although there are also primary studies focused on indirect measures of DoS levels such as triangulation (e.g., Bresin, Murdock, Marszalek, & Stapley, 2017). The DSI is the most commonly used measure for assessing the construct of DoS, including the DSI adaptations (e.g., DSI-R, DSI-SF, DSRI-RN). Twenty-seven primary studies used the DSI or adaptations of the DSI ($k = 27$; 56%), and these studies were conducted in 11 different countries (Table A.9). Among the 17 DoS measurement studies conducted with minorities or outside the United States, most use the DSI self-report measure ($k = 16$; 94%; see Table A.9).

3.5.2. Psychotherapy

A total of 16 primary studies addressed a topic related to psychotherapy (e.g., therapeutic alliance, changes in individual levels of DoS due to clinical intervention). All but two primary studies included in this topic area were conducted with samples from the United States ($k = 14$; 87.5%), the other two studies were carried out in Iran. A variety of methodological approaches have been used among studies in this psychotherapy topic area (e.g., longitudinal, cross-sectional, quasi-experimental, experimental, and pre-test post-test). Seven studies used samples of couples, whereas one study was conducted with emerging adults; ten studies were conducted with community samples ($k = 10$, 50%). Half of the studies in this topic area were conducted with samples of fewer than 100 individuals ($k = 8$; 50%), which is a typical sample size when conducting psychotherapy research. Finally, the DSI or DSI-R was the measure most often used in psychotherapy-focused DoS research ($k = 10$; 62.5%; see Table A.10).

3.5.3. Other topics

Because of their heterogeneity, we could not identify a cohesive category for the remaining 85 primary studies that did not test a specific BFST DoS hypothesis. The issues addressed by these other studies (listed in Table A.11.) included: spirituality (e.g., Crabtree et al., 2020), acculturation processes (e.g., Roytburd & Friedlander, 2008), trauma (e.g., Zerach, 2015), and personality disorders (e..g, Sandage, Jankowski, Bissonette, & Paine, 2017). The DSI or DSI-R was again the most frequent self-report measure used ($k = 67$; 78.8%), cross-sectional designs were the most common ($k = 73$; 85.9%), and samples from the United States were the most highly represented ($k = 42$; 49.4%). The majority of primary studies included in this category were conducted in non-clinical settings ($k = 82$; 96.5%) and with samples of college students or emerging adults ($k = 46$; 54.1%; see Table A.11).

4. Discussion

Research on BFST and psychotherapy approaches using BFST continue to grow, with a core emphasis on the central construct of DoS. This scoping review was used to map existing empirical research on Bowen's seven hypotheses on DoS. Extensive searches of scientific literature through databases and hand searching identified 262 articles that met the inclusion criteria, which in turn, included a total of 284 primary studies. The large number of included primary studies in this work and their heterogeneity demonstrates the value of the broad approach of this scoping review.

Scoping reviews are often used as a precursor to systematic reviews by mapping a body of evidence and providing a clear description of the types of evidence available to pursue additional or more narrowly focused research questions (Munn et al., 2018). Scoping reviews, therefore, focus on describing the breadth of a body of evidence, rather than focusing on the quality of evidence or a quantitative evaluation of the evidence supporting a practice, theory, or policy — goals that are most commonly the focus of systematic reviews and meta-analyses. Considering the growing number of primary studies in the last 20 years and the lack of any type of review on this field since 2004, we conducted this scoping review to provide a synthesis of types of evidence available in support of Bowen's construct of DoS, to review the types of research methodology most commonly used in this area of research, and finally to identify knowledge gaps regarding empirical support for DoS and its theoretical assumptions. To address these aims, conducting a scoping review was deemed the most appropriate choice.

This is the first scoping review in the field of BFST since its inception (1978). Further, no systematic reviews or meta-analyses have been conducted on BFST or the topic of DoS specifically. Extending from foundational narrative review work conducted by Miller et al. (2004), in which the broader concepts of BFST were reviewed, this scoping review sought to examine the literature base on BFST on seven hypotheses specifically related to the construct DoS using rigorous PRISMA-ScR scoping methods (Tricco et al., 2018). These methods included consensus coding methods to decrease error in data collection and to increase confidence in the findings presented in this review. Additionally, we sought to follow a transparent and reproducible protocol (Calatrava et al., 2020).

From the compiled results of this scoping review, we found that the empirical evidence in support of each of Bowen's seven hypotheses varied across primary studies. For hypotheses testing associations between DoS and other outcomes (H1, H2, H3, and H4), the relationship between levels of DoS and health outcomes was supported by around two-thirds of the primary studies. In most cases, evidence did not show support of the hypothesis on the similarity of a couples' similar levels of

DoS (H5). Last, the hypotheses on the stability and the intergenerational transmission of the levels of DoS (H6 and H7) remain largely untested, with few primary studies specifically examining these hypotheses.

The overwhelming proportion of primary studies conducted on DoS have looked at associations between DoS and psychological health, and to a lesser extent, physical health. The majority of primary studies in this area have demonstrated evidence suggesting that greater DoS is associated with better psychological health (H1), which was measured in a large number of ways (e.g., Bartle-Haring & Lal, 2010; Hooper & Doehler, 2011; Jankowski et al., 2013b; Lampis et al., 2020). Similarly, those primary studies showing evidence in support of H2 found that greater DoS was associated with better physical health (e.g., lower prevalence of diabetes, obesity). This is a notable advancement in the field since more than 15 years ago, Miller and colleagues (Miller et al., 2004) found that the DoS and physical health relationship had only been researched in one study at the time the review was conducted. Conversely, we found 17 primary studies where this relationship was examined in our recent literature search, with 88% of primary studies demonstrating some evidence in support of the DoS and physical health connection. Although this represents growth in this area of research, this line of work is relatively recent, with far fewer primary studies ($k = 2$) examining measures of DoS in conjunction with biological, physiological, or objective measures of physical health. The existing two studies look at associations between DoS and diabetes (Cohen, Peleg, Sarhana, Lam, & Haimov, 2019) and DoS and body mass index (Hooper & Doehler, 2011).

Additionally, the majority of primary studies examining associations between DoS and health have done so within cross-sectional designs (Didericksen, Edwards, & Walker, 2015; Murray, Daniels, & Murray, 2006; Skowron, 2004). Therefore, this body of work is limited by the inability to draw inferences about the direction of the relationship between DoS and health. For example, it is not well-known whether higher DoS leads to better health outcomes or if persons with better psychological and physical health are also able to more effectively work on the process of developing greater DoS. Longitudinal research using causal designs would have valuable implications for interventions designed to enhance the relational health and physical and psychological well-being of clients. Of note, a large number of primary studies classified into H1 and H2 were conducted on international samples outside of the United States (Cunha, de Sousa, & Relvas, 2017; Işik et al., 2020; Peleg et al., 2018; Rodríguez-González, Lampis, Murdock, Schweer-Collins, & Lyons, 2020; Thorberg & Lyvers, 2006; Tuason & Friedlander, 2000; Xue et al., 2018). An important strength of the literature is that these associations have been documented across many different nationalities and cultural groups.

Given the BFST emphasis on family and relational systems functioning, it makes sense that a large number of primary studies have also examined DoS and its associations with couple and intergenerational relationship functioning. In this scoping review, we identified a large number of primary studies that looked at associations between DoS and the couple relationship relative to the number of studies that examined the relationship between DoS and intergenerational relationships (56 and 19, respectively), which primarily focused on parent-child relationships regardless of whether the child was young, an adolescent, or an adult child (Peleg, Halaby, Whaby, & (Nehaya)., 2006; Rodríguez-González et al., 2019b; Skowron, Kozlowski, & Pincus, 2010). Although there was support for both of these Bowen hypotheses (H3, H4), there remain several unanswered questions. These questions are largely due to the majority of these studies being conducted through cross-sectional designs that limit an understanding of whether DoS facilitates greater couple satisfaction and functioning, as Bowen posited.

In contrast to the large body of empirical support for H1 – H4, we found limited evidence to substantiate Bowen's proposition that couples share similar levels of DoS. For those few primary studies that evidenced some support of H5 ($k = 5$, 31.3%), only partial support was found. For example, two recent primary studies (Bartle-Haring et al., 2019; Handley et al., 2019) found that some couples demonstrated similar levels of DoS using advanced analysis accounting for each partner's DoS score (i.e., actor-partner interdependence modeling). Bartle-Haring and colleagues (Bartle-Haring et al., 2019) found that one of the four sample subgroups demonstrated actual correspondence in levels of DoS, whereas findings from Handley (Handley et al., 2019) demonstrated only interdependence among couple's individual levels of differentiation (i.e., similar to measures of correlation, interdependence may be both positive [both partners have high or low levels] or inverse [one partner has a high level and the second partner has a low level, but the levels are associated]). Other primary studies that have partially supported Bowen's hypothesis of couple similarity in levels of differentiation have only found that couples' levels of DoS are correlated (Bartle, 1993) on some — but not all — subscale dimensions of differentiation (Peleg & Yitzhak, 2011). According to some authors, sample selection, measures used, and types of statistical analyses may affect study results and contribute to mixed findings regarding a couple's differing or similar levels of DoS (Bartle, 1993). Our data demonstrate the heterogeneity of these primary studies concerning H5, as expected. Work in this area should continue to build on cutting-edge methods for dyadic research including Actor-Partner Interdependence Model (APIM) modeling, which is among the most appropriate for statistically addressing the interdependency of dyadic data (see examples in Bartle-Haring et al., 2019; Cook & Kenny, 2005; Handley et al., 2019b). Additionally, longitudinal data can further advance what is known about how couples' DoS levels (if malleable) shift jointly or independently across time.

This evidence identified in this review also suggests that there are several BFST tenants regarding DoS that have received little empirical attention or support. These gaps include Bowen's hypothesis that individuals have relatively stable levels of DoS across time (H6) and that similar levels of DoS are transmitted across generations (H7). Since the Miller review (Miller et al., 2004) only one recent study has examined within-person stability in DoS levels. This single study did not provide evidence in support of Bowen's hypothesis (Handley et al., 2019). Given the paucity of research on H6 in the past 15 years, it raises questions regarding the potential challenges and research designs that are necessary to adequately test this hypothesis. Assessing within-person stability requires repeated measurement designs, which are often difficult to obtain. Handley and colleagues (Handley et al., 2019) provide an exemplar study in this area by modeling longitudinal data across a timeframe of five years. The authors suggest that it is plausible that Bowen's tenant about the stability of DoS across time is not accurate, although they also raise important questions about the limitations of using only a self-report questionnaire for the complex construct of DoS (Handley et al., 2019). Given the scarce empirical study in this area, more research is needed to test this hypothesis.

A second area with insufficient empirical attention to date is Bowen's hypothesis that levels of DoS are relatively similar across generations (H7). Only five primary studies have examined this BFST hypothesis, and the most recent empirical study occurred in 2005. Two studies support hypothesis 7 (Klever, 2005; Peleg, 2005). Peleg, for example, found a positive correlation between parent and child DoS scores. Future primary studies are needed to determine if mean levels of DoS are also equivalent among dyads. Applications of the APIM model for parent-child dyad are well-suited for examining Bowen's hypothesis on the intergenerational transmission of similar levels of DoS (Cook & Kenny, 2005). Intergenerational research is also subject to many of the challenges raised above, including the necessity of longitudinal research and the need to recruit and measure DoS in two generations (e.g., parent and offspring). Additionally, there exist no valid measures of DoS for young children, so the sampling timeframe is limited to parents of children in late adolescence or parents and their adult offspring.

We found several studies we classified around three main topics (i.e., measurement, psychotherapy, and other). These 152 primary studies show additional research questions addressed in the literature. These lines of inquiry are grounded in BFST, but they do not directly test BFST

hypotheses about DoS. In particular, the variety of studies classified under the *other* label ($k = 85$) showed how prolific and innovative this research field is, with a high range of topics that examine DoS in relation to other variables or constructs of interest (e.g., spirituality, acculturation, or trauma).

Several studies were classified under the topic *measurement* ($k = 51$), which is an important line of inquiry and a challenge. To date, research on the measurement and assessment of DoS has focused exclusively on self-report questionnaires, with several different instruments having been developed. Some of the DoS measures have been used only by the measure authors themselves, but others have become commonly used in this research area. Among them, the DSI or DSI-R is the most widely used, in the USA and internationally. Importantly, several cross-cultural validations of the DSI-R have been developed and tested (e.g., Işik & Bulduk, 2015; Lam & Chan-So, 2015; Lampis et al., 2019; Major, Miranda, Rodríguez-González, & Relvas, 2014; Rodríguez-González, Skowron, & Jódar Anchía, 2015). The DoS measurement studies identified in this review also reflect limitations of the measurement of DoS to date. Broadly, the construct validity of DoS self-report questionnaires has been tested using prior self-reports of DoS or other self-reported measures of anxiety. Thus, multi-observer measurement of DoS is an important next step in this field of study.

Regarding the actual measure used to index DoS, the DSI (and subsequent versions including the DSI-R or DSI-SF) has been the most commonly used instrument, both in the number of studies that use the DSI and in the number of cultural adaptations of this instrument. Further, in our review we identified that the DSI is also most common among the studies that use clinical samples, studies addressing DoS-focused psychotherapy intervention, and those studies that are longitudinal. Although DoS is a complex construct and there is some theoretical discussion in the field about best practices regarding its measurement, there is also a broad consensus that DoS is a bi-dimensional construct. Perhaps this close tie to BFST is one reason that the DSI is so widely used, and that cross-cultural validations of the DSI continue to be conducted (e.g., Neophytou, Schweer-Collins, Rodríguez-González, Jódar, & Skowron, 2021).

Another growing area of research is the topic of how DoS can be modified through psychotherapy ($k = 16$). Nearly all studies classified into this topic were conducted in the United States. This could be attributable to two factors: first, psychotherapy research is more developed in the United States than in other countries (e.g., Italy or Spain), and second, because BFST was developed in the United States, it is likely that a higher number of practitioners, family therapists, and researchers in the United States are familiar with this theory. Although there is a growing body of research on the topic of DoS and psychotherapy, the studies identified in this scoping review demonstrate a paucity of empirical research on intervention and psychotherapy process research examining whether DoS-focused interventions (or other non-DoS focused but systemic interventions) can effectively modify DoS itself and subsequently, improve couple and parent-child relational satisfaction and functioning.

5. Future directions

Important directions emerged through this scoping review that researchers can use in their ongoing and future research projects. The literature in the field showed several DoS hypotheses have been replicated; however, these studies often use similar research designs and methods and therefore are subject to the same limitations (Bartle-Haring et al., 2019; Miller et al., 2004; Rodríguez-González et al., 2019a; Rodríguez-González, Lampis, Murdock, Schweer-Collins, & Lyons, 2020). The paucity of research on the topics Miller and collaborators (Miller et al., 2004) suggested as central for moving BFST DoS-focused research forward continues to persist. Since 2004, studies on the relationship between DoS and the quality of marital relationships and DoS and psychological health or well-being, have proliferated; however, even in these common research areas, few longitudinal studies, cross-cultural studies, or studies with large samples (e.g., more than 500 individuals) exist. At the same time, other hypotheses remain almost unexplored (e.g., the stability of DoS).

The relative scarcity of longitudinal data on DoS continues to be the most salient gap in the field. Cohort and registries studies, which would enable researchers to analyze personal, couple, and intergenerational trajectories of DoS, are needed. These studies will shed light on the potential predictive long-term effects of DoS regarding psychological, physical, and family relationship health (both couple and parent-children). Importantly, longitudinal dyadic studies using couples and parent-child dyads as the unit of analysis would be particularly valuable given that this review only found two longitudinal studies investigating the similarity of DoS levels among intergenerational relationships and only one study explored the intergenerational transmission of DoS. A study involving three generations, which could disentangle the links between parents-children and grandparents-children, would certainly be innovative. Furthermore, we now have the statistical tools to appropriately analyze these hypotheses through repeated measures and nested analytic approaches. Together with multi-informant data, generational studies will provide insight into the mechanisms that underlie the intergenerational transmission of DoS. Longitudinal studies that analyze the stability of DoS across development would also provide data on DoS for adolescents, middle-aged, and elderly populations. Thus, researchers could also better understand the relevance of DoS for young adults, a topic that is largely unknown.

Concerning the assessment of DoS, measurement could be made more robust by the inclusion of objective measures or information collected through multiple respondents (e.g., clinical semi-structured interviews, partner and participant report, clinician report). Studies using ROC curves and confirming DoS cut-off points with semi-structured interviews conducted by trained therapists, as proposed by Frost (Frost, 2014), could increase researchers' abilities to test the stability of the construct.

To increase the ability of researchers and clinicians to compare findings across primary studies, it is also recommended that researchers use consistent measures to assess physical health, psychological health, and the quality of couple and parental relationships. The accessibility of robust objective measures of health has increased in recent years (Matthay et al., 2020). Therefore, studies that examine DoS in relation to biological, hormonal, and neural outcomes are more feasible and would be valuable to the field.

To date, fewer than 20 studies have investigated the effects of psychotherapy on DoS, and fewer than 10 were based on clinical populations. Future studies that incorporate causal designs and that explore pre- to post changes in DoS following intervention could advance the field's understanding of the applied significance of addressing DoS in family therapy and other therapy modalities.

6. Strengths and limitations

The strengths of this scoping review include the systematic review of all published studies to date from four databases, the a priori review protocol, and that studies were selected as eligible and data were extracted through a systematic process by three independent researchers. Nevertheless, this review has limitations arising both from the included studies and the complexity of the research questions involved in this scoping review.

Despite the comprehensive nature of this review and the wide number of sources scanned, the limitation of our search only to English, Spanish and Portuguese language studies may have influenced the nature of the evidence categorized in this review. We have reported all potentially eligible articles found in other languages (Supplementary Table 2) to limit the potential of publication bias in this review due to this decision. Although only 75% of all data extraction was double coded by two reviewers, we provided a secondary data check for the remaining

25% of the data by a third reviewer to address this limitation. Moreover, as this is a scoping review, we did not evaluate the quality of the included primary studies. Future systematic reviews and meta-analyses should examine the quality of studies based on primary study methodology.

Researchers and practitioners should continue to exercise caution when generalizing the findings of this review to populations not included in the primary studies. The existing primary studies on DoS are limited by the over-sampling of White, heterosexual, and United States-based populations. One implication of this limitation is that the field of BFST lacks a critical understanding of the relevance and utility of DoS for the health and well-being of populations that often face the greatest systemic inequities. Importantly, the field of DoS should continue to intentionally test the relevance of BFST hypotheses with underserved populations, including individuals with different gender, racial, ethnic, national, cultural, and sexual identities and the intersections among these identities.

7. Conclusion

In this scoping review, we provide a systematic overview of the empirical evidence regarding seven central DoS hypotheses. This work provides a synthesis of the hypotheses identified and the main characteristics of primary studies conducted in the field. The findings provide valuable information to psychologists, mental health clinicians, and family therapists as well as researchers by identifying prominent research gaps that are important to address through future studies on DoS. In addition, this review provides a starting point and justification, for future opportunities to increase the rigor of evidence in the field. Although the challenges of researching family systems and DoS are many, the methodological considerations raised in this review are important areas for researchers to address to move the field forward in testing the validity of Bowen's DoS hypotheses and to increase our understanding of the applied significance of targeting DoS in psychotherapy interventions.

Author contributions

MVM, MRG and MC designed the study. MSC drafted the study protocol. MVM, MRG and MC designed and performed the search strategy. MRG and MC performed calibration phases, screening, and selections steps. CDC conducted grey literature searches. MC and CDC extracted the data. MRG crosschecked data extraction. MVM, MRG and MSC interpreted the data. All authors were substantively involved in drafting sections of the manuscript and all contributed to manuscript revisions. Last, all authors read and approved the final submission of this manuscript.

Declaration of Competing Interest

None

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Appendix A. Supplementary data

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